

## THE WELFARE OF MAMMALS IN ZOOS

When director of the New York Zoological Park William T. Hornaday wrote "It is well that all visitors should know, that all net profits realized in the Park go directly toward the increase of the animal collections.", there were 177 species of mammals represented by 625 individuals at the park (Hornaday, 1906, p. 2). The early zoos of the U.S. raced to collect as vast an array of species as possible giving the public a chance to view animals they had only heard of or read about. Hornaday made no secret of the lack of knowledge necessary to keep exotic mammals alive. "Fame awaits the man who can discover a bill of fare on which Howling Monkeys, Sakis and Yerkees can live in captivity to adolescence, and repay their cost and care." (Hornaday, 1906, p.20) Nevertheless, "So far as the available supply of captive primates will permit, these typical species will constantly be kept on exhibition, together with many others equally interesting." (Hornaday, 1906, p. 15).

It soon became apparent to fledgling American zoos that basic care and husbandry of the species was essential to maintain the integrity of the collection and perhaps allow for the vending or exchange of animals among institutions. Although the modern concept of animal welfare and its relevance to zoos were not yet formally defined, once an animal could be kept alive in captivity, its "comfort" and "satisfaction" could be addressed. Hornaday (1906) wrote of comfortable quarters in terms of floor space available in an enclosure and heated retreats and noted

that some animals could become ill and die due to "sullenness" and "lack of exercise". According to former National Zoological Park director (1925-1956), William M. Mann (1957), animals are satisfied with captivity because they are free from fear of predation, starvation, defending territory, parasites, and anxieties associated with aging in the wild. Mann also believed that what is now considered to be stereotypic pacing is due to the animal's need for exercise and to work off excess energy. "The cage hasn't much to do with it." he wrote (Mann, 1957, p. 507).

### Animal Transport

Although mammals could be readily obtained by hired collectors in the early 1900s, the costs of collection and transport could be prohibitive depending on the political climate of the exporting country, the rarity of the species, and the conditions of shipment. Before the first World War, when East Africa was under German occupation, animal supplier Carl Hagenbeck sold giraffes for \$1500 and \$2000 per animal. Following the war, however, Germany succeeded East Africa to the British and the price of Hagenbeck's giraffes ranged between \$5,000 and \$7500 (Laufer, 1928). Although prior to 1969 there were no professional or legal guidelines regulating exhibit animal welfare in transport (except for quarantine, disease control laws, and endangered species), some of the large animal wholesalers such as F. H. Zeehandelaar provided insurance that

the animal will survive at the facility for at least 30 days post-shipment (Zeehandelaar and Sarnoff, 1971).

Early capture, shipping conditions, and introduction of a wild-caught animal to a zoo environment were governed by trial-and-error as zoos ventured to exhibit the "never before seen in America" species (Hornaday, 1906; Mann, 1957; Zeehandelaar and Sarnoff, 1971). Hunters, whalers, and military personnel could be commissioned to bring zoos living trophies of their expeditions. The need for U.S. military to transport horses and mules to strategic locations during World War II ushered in the age of air animal transport. Air transport helped increased animal survivability due to less transport time than was necessary on oceanic cruises and continental railways (Barreto, 1992).

By 1970, legislation and professional societies made animal welfare an important aspect of exhibit animal transportation. In 1969, the Live Animal Board of the International Air Transport Association (IATA) released the IATA Live Animal Regulations (LAR). The LAR contains species or taxon-specific guidelines on container construction, ventilation, bedding, density of animals per container, and placement of feed and water containers (IATA, 1992). Member compliance with the regulations were originally voluntary. As of January 1993, however, the United Nation's CITES member nations (Convention on the International Trade of

Endangered Species), the European Community, and the U.S. Fish and Wildlife Service have made the regulations mandatory and enforceable for all international air transport of mammals. The IAR is constantly being revised and updated to incorporate the latest scientific research and technologies (Chan, 1992).

Animal welfare during transport within the United States is regulated by the U.S. Department of Agriculture through the regulations of the Animal Welfare Act (Title 9, Code of Federal Regulations, Chapter 1, Subchapter A - Animal Welfare). The regulations mandate specific transportation standards for carrier and intermediate handler consignments, suitability of the transport enclosure, vehicle design and suitability, food and water requirements, care of the animals during transit and at terminal facilities, and handling and positioning of containers to minimize animal distress. Although some mammals such as guinea pigs, non-human primates, and marine mammals have specific regulations, most mammals are covered together under more general regulations. Like the IATA regulations, the Federal regulations are often modified from year to year. USDA APHIS/REAC (Animal and Plant Health Inspection Service/Regulatory Enforcement and Animal Care) inspectors enforce compliance at airports, ocean ports, rail stations, and both initial and terminal facilities. They may inquire about or ask for a demonstration of animal loading procedures, carrier or container temperature regulation and waste disposal, as well as assessing the compatibility of

animals that are shipped together (Taylor, 1992).

### Animal Welfare and Exhibition

Many of the zoos of the early twentieth century were established for more than entertainment. Some were created with the missions that modern zoos share: conservation, education, research, and recreation (AAZPA, 1986). In 1887, W.T. Hornaday, then taxidermist at the Smithsonian Institution, proposed establishing a national zoo as a sanctuary for the American bison which he feared would become extinct if not given protection in captivity. In 1889, the National Zoological Park was established by Congress "...for the advancement of science and the instruction and recreation of the people..." (Bain, 1989).

However, even the Federal zoo had a limited budget and many animals were acquired as foreign gifts to Presidents, unwanted exotic pets, or circus donations (Bain, 1989; Mullen and Marvin, 1987). Zoos increased their collections to sustain themselves through gate revenue and to morally equate themselves as "living museums" (Mullen and Marvin, 1987). Visitors took civic pride in interacting with the animals as much as possible. They fed them, they rode them, and they delighted in zoo-sponsored shows that portrayed the animals in anthropomorphic ways. Hornaday (1906, p. 16) wrote that the orang-utan "...can easily be taught to wear clothes, sit at table, and eat with spoon and fork...Such exhibitions are entirely germane to the educational purposes of a

zoological garden or park, for they illustrate the mentality of animals, and their wonderful likeness to man, far more forcibly than the best printed statements."

With few exceptions, early American zoo exhibits and those of the royal menageries of Europe were designed to give the visitor the best view possible of the animal. This meant small cages with as few barriers between visitor and animal as possible (Mullan and Marvin, 1987). In 1907, animal supplier Carl Hagenbeck opened a zoo at Stellingen (outside Hamburg). Hagenbeck's zoo revolutionized the modern zoo by depicting animals as he had seen them in the wild. He attempted to artificially recreate habitat including not only physical aspects such as topography, but thermal aspects as well. Hidden moats substituted for metal bars that gave the impression of incarceration (Hagenbeck, 1910). Many of Hagenbeck's ideas were imported by fledgling American zoos such as the Bronx Zoo where mixed species naturalistic exhibits became commonplace.

In the 1960s, the role of zoos began to shift from being primarily recreation to education and conservation. To be able to propagate endangered species meant that zoos needed to become aware of the animal's psychological needs. These needs were addressed systematically by Heini Hediger, director of the Zurich Zoological Gardens, who outlined how the animal's physical and social environment in captivity can affect its behavior (Hediger

1964, 1968). He demonstrated that abnormal or maladaptive behaviors can be the result of factors such as rearing environment, lack of environmental cues and stimulus, and spacial requirements. Growth, reproduction, general health, and longevity could be improved if man would view the animal from the animal's perspective and not from his own.

Public Law 91-579, "The Animal Welfare Act of 1970" brought exhibitors into the arena of Federally-regulated animal welfare requirements. The U.S. Department of Agriculture was charged with designing regulations for all warm-blooded vertebrates except birds, mice of the genus Mus and rats of the genus Rattus, and farm animals not used in agricultural shows or production of food and fiber. Farm animals in petting zoos are, for example, regulated as are cotton rats and a myriad of other rodent species. The regulations (Title 9, Code of Federal Regulations, Chapter 1, Subchapter A - Animal Welfare) cover veterinary care, recordkeeping, facilities and operating standards, and animal health and husbandry standards.

The American zoo world's professional association, the American Association of Zoological Parks and Aquariums (AAZPA) has supported and assisted in the development of the regulations since their inception (Hutchins, Pers. comm., 1993). The AAZPA, founded in 1924, mandates that its 162 member institutions (as of September 23, 1993--L. Boyd, Pers. comm., Sept. 1993) abide by a

code of ethics that include animal welfare considerations (AAZPA, 1990). A facility can lose its prestigious accreditation if it does not abide by obligations that include moral responsibilities to the animals and assure that "...exotic animals do not find their way into the hands of those not qualified to care for them properly."

The AAZPA has led the way in encouraging its members to focus on animal welfare. The Association's conservation programs such as The Species Survival Plan (SSP) and Taxonomic Advisory Groups (TAG) as well as the Mammals Standards Committee are developing guidelines and husbandry manuals which include environmental enrichment (Willis et al., 1992). Appropriate species-typical behavior such as reproduction and parental behaviors in mammals must be stimulated in captivity to ensure successful breeding programs, reintroductions to the wild, better public education, and removal of confounding variables such as abnormal behaviors in zoo research when the animal sample size is small (Kreger et al., Unpublished, 1993). The AAZPA has also sponsored conferences on ethics and animal care as well as environmental enrichment. Both the AAZPA School for Professional Management Development for Zoo and Aquarium Personnel and School for Applied Zoo and Aquarium Biology include sessions on zoo/aquarium biology ethics.

Although the Association is comprised of the major zoos and



aquariums in the United States, as of September 1992, there were 1618 USDA licensed exhibitors and 54 registered exhibitors (not money-making ventures) (USDA, 1992). The fact that the 1992 numbers have increased from 1,444 licensed and 51 registered exhibitors in 1991 (USDA, 1991) indicates the growth in this field. It is important to note that the USDA exhibitor can be a roadside zoo, traveling exhibit, educational demonstration center with one or two animals, circuses, seasonal facilities, as well as major metropolitan zoos and aquariums. It is also important to note that while some AAZPA institutions do not contain mammals (ie aviaries, aquariums), all of the USDA regulated facilities do as they are the only class of animals regulated by the Animal Welfare Act.

Because good animal welfare helps zoos improve their missions and rallies public and municipal support, there has been a surge in applied animal behavior research since the 1980s. The concept of environmental enrichment or behavioral enrichment and its potential in zoos was introduced by Hal Markowitz in his book Behavioral Enrichment in the Zoo (1982). Zoo biologists trained in applied ethology report their scientific findings in the journal Zoo Biology. More anecdotal results are published in "Enrichment Options"- a regular feature of Animal Keepers' Forum published by the American Association of Zoo Keepers and in The Shape of Enrichment - a quarterly newsletter produced in San Diego. Many zoo research programs are designed with written

policies on the humane care and use of the study animal (Hutchins, 1990; Kleiman, 1985).

According to Hutchins and Fascione (1991) the four most pressing ethical issues facing zoos today are the acquisition of animals for captive breeding programs, disposal of surplus animals, use of the animals in research, education, and recreation and basic animal care and housing standards. The issue of zoos as a repository for unwanted exotic pets and orphaned wild animals was raised at the session on ethics at the 1993 AAZPA Annual Meeting held in Omaha, Nebraska.

Zoos occasionally remove whole populations of an endangered species from the wild for "last chance" captive breeding programs with the goal of eventual reintroduction when the cause of the species demise is removed (Hutchins and Weise, 1991). Such is the case for mammals such as the Przewalski horse, black-footed ferret, and the Arabian oryx. Opponents argue that the animals should be conserved in situ or allowed to live out their natural lives in the wild (Fox, 1986; Varner and Monroe, 1991). Hutchins and Fascione (1991) argue that zoo management of endangered species can highlight the species' plight to the public and encourage habitat protection (which protects many other incidental species) where habitat may not be an issue had the species been permitted to become extinct in situ. Zoos also have the advantage of genetically managing the species in captivity to

avoid inbreeding that occurs in small wild populations, providing regular veterinary care, nutritious diets, and freedom from predators. Finally, Hutchins and Fascione point out that most zoos are supported by city and state governments. The likelihood of those supporters to channel their funds to in situ conservation efforts rather than zoos is slim.

Past indiscriminate breeding, limited numbers of housing space, attempts to increase genetic diversity, and few contraception technologies have resulted in zoos producing many surplus animals (Fox, 1986; Lindberg, 1991; Hutchins and Fascione, 1991). Although contraception and separating sexes is a proactive means of avoiding surplus, animals that are genetically overrepresented or that do not fit into a zoo's long or short term plan may need to be sold, transferred, or euthanized. Some animal protection groups that support euthanasia for domestic animals, strongly oppose its use in zoo animals (Fox, 1986). They believe zoo animals should lead a complete quality life from birth to death at the zoo's expense and oppose zoos selling animals to biomedical research, hunting ranches, pet stores, and auctions (Clifton, 1988; Haworth and Travers, 1993). Although the AAZPA Code of Ethics prohibits such sales to those unable to adequately care for the animals as well as selling animals for "canned hunts", many zoos are not AAZPA accredited and even those who are often do not follow-up on the care and use of the animals following sale (Haworth and Travers,

1993).

Zoo research has covered areas such as animal nutrition, behavior, genetics, veterinary medicine, and reproductive biology (Hutchins and Fascione, 1991). Most of this research is non-invasive and deals with small sample sizes. The results have led to better animal husbandry, management, and conservation both in captivity and in the field. Zoo education efforts have included the use of live animals in demonstrations which have been shown to positively change public attitudes towards species like killer whales and gorillas. Even the use of animals in rides such as elephants and camels, animals that have been domesticated for hundreds of years, can provide zoo visitors with their first hands-on exposure to these animals and create a lasting, caring impression as well as revenue for zoo programs (Hutchins and Fascione, 1991). Opponents argue that the use of animals in research, education, and recreation is demeaning, demonstrates the human speciesist attitude, and gives the visitor the impression of dominance rather than compassion (Fox, 1986; Reagan, 1983).

Zoo opponents also argue that zoos can never duplicate the complexity of the animal's natural environment (Fox, 1986). While this is important particularly in cases where reintroduction to the wild is the objective (Kleiman, 1989), when the goal of maintaining an animal on exhibit is education or

breeding, including a heavy load of parasites, noxious plants, predators, disease, and food scarcities may not be in the best interest of the animal. Exhibits are becoming more complex with the growth of the wild animal parks and increasing mixed species exhibits where species are compatible.

A final ethical issue was mentioned at the end of a discussion session on ethics at the 1994 AAZPA Annual Meeting. A zoo director stated that while many people may oppose zoos, it is often the first place they contact when they wish to dispose of an unwanted exotic pet or an orphaned or injured wild animal. What role or obligations do zoos have as custodians of "the ark" in this respect? With limited financial and spatial resources which are critically needed for specific animals and programs, how much should the zoos be involved in wildlife rehabilitation or deciding the fate of unwanted pets - especially when not acting will jeopardize the animal's well-being?

### Conclusion

Keeping wild mammals in captivity has raised many ethical issues regarding animal welfare in recent years. Zoos have evolved from curiosity shops to centers of conservation. Even the New York Zoological Society has changed the name of the Bronx Zoo to the International Wildlife Conservation Park to reflect its current role. Animal care and transport has improved through legislation and guidance of professional societies. Zoo research

has brought animals back from the brink of extinction as well as reduced the need for taking animals from the wild by creating self-sustaining genetically managed captive populations. Ethical challenges presented by opponents have served as a prod for zoos to constantly evaluate and justify their missions and to ensure that the animals in the collection get the best care possible.

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